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THE RELATIONSHIP BETWEEN OSTEOPHYTES IN THE KNEE JOINT, OSTEOARTHRITIS AND AGING

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Danielsson (1964) demonstrated that osteophytes on the articular edges of the hip joint are not related to the clinical entity of osteoarthritis of the hip which includes narrowing of the joint space and juxta-articular structural changes. Jacqueline et al. (1950) and Jacqueline & Veraguth (1954) stated that osteophytes in the hip rather relate to the process of aging. Ahlbäck (1968) in a radiographical study of osteoarthritis of the knee joint found that osteophytes increased with increasing obliteration of the joint space. Danielsson & Hernborg (1970) found that only about one-third of the individuals with radiographically obvious osteophytes in the knee joint later in life developed osteoarthritis with structural changes. The objective of the present investigation was to study the relationship of osteophytes in the knee joint, aging and osteoarthritis.

MATERIAL AND METHODS

176 knee joints sampled in the archives of the Roentgen Diagnostic Department, Malmö, in which radiographical evidence of osteophyte formation had been present during the years 1950–1958, were re-investigated in 1968. According to the outcome of the two investigations the patients were divided into three groups:

Group I: 52 knee joints with osteophytes only in the initial radiogram in which structural changes had not developed during the follow-up.

Group II: 34 joints with osteophytes only in the initial radiogram, who had in the meantime developed structural changes.

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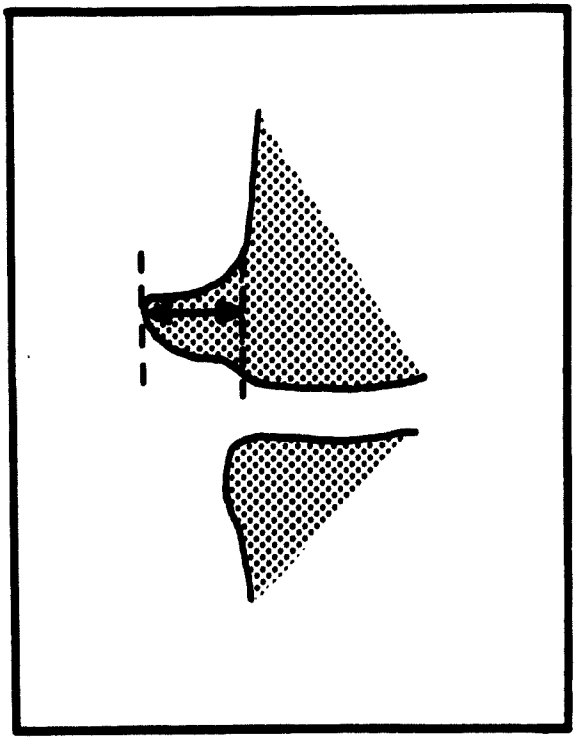

Figure 1. Measurement of osteophytes.

Group III: 90 knee joints with structural changes as well as osteophytes at the time of the initial radiogram.

In addition to the three groups of re-investigated cases the radiograms of 57 patients* with a previous injury to the anterior cruciate ligament which had been verified by surgery were studied. The average age of these individuals was about 26 years, considerably less than in the material related above. The time elapsed between the injury and the radiogram was about 2½ years.

In all the films the osteophytes were measured by means of a caliper and the size was defined as the largest perpendicular distance from the corticalis to the outer margin of the osteophyte (Figure 1). When osteophytes were present on the tibia as well as on the femur the largest one was chosen. The measure used for further calculation was the sum of the largest osteophytes on the lateral and the medial aspects of the knee. Only the antero-posterior radiograms were used: the position of the knee joint, which may be of importance for the measured value, varied somewhat between the cases but not significantly between the groups, and the magnification of the image could not be demonstrated to differ systematically.

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* Coirtesy of Prof. S. O. Liljedahl, Dept. of Surgery, Linköping Hospital.

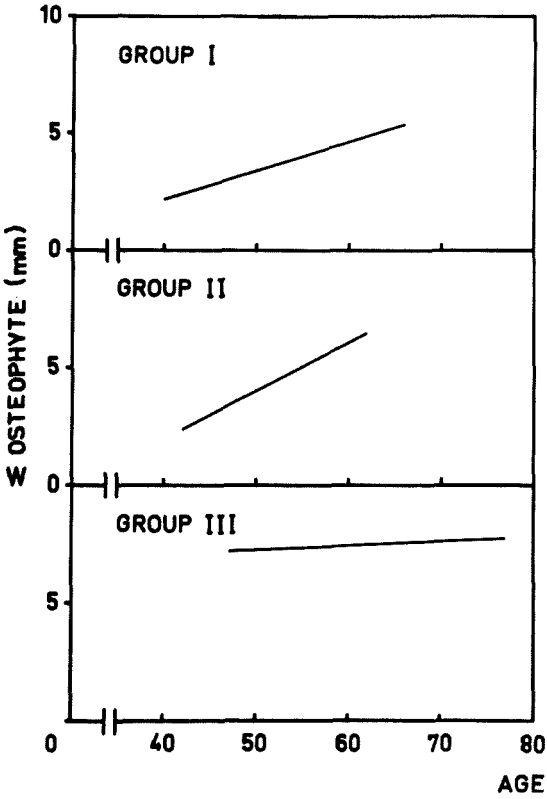

Figure 2. The relationship between age at the time of the initial radiogram and the combined size of knee osteophytes. There are significant positive correlations in Groups I and II but not in Group III.

Table 1. Age and osteophyte size at the time of the first radiogram (Av ± SD).

Group	Age	Osteophyte size (mm)
I	53.4 ± 6.8	3.8 ± 2.6
II	52.7 ± 5.0	4.6 ± 3.0
III	62.9 ± 7.6	7.5 ± 3.9

RESULTS

The size of the initially observed osteophytes did not differ significantly between joints which did and joints which did not develop structural changes during the time of observation (Groups II and I).

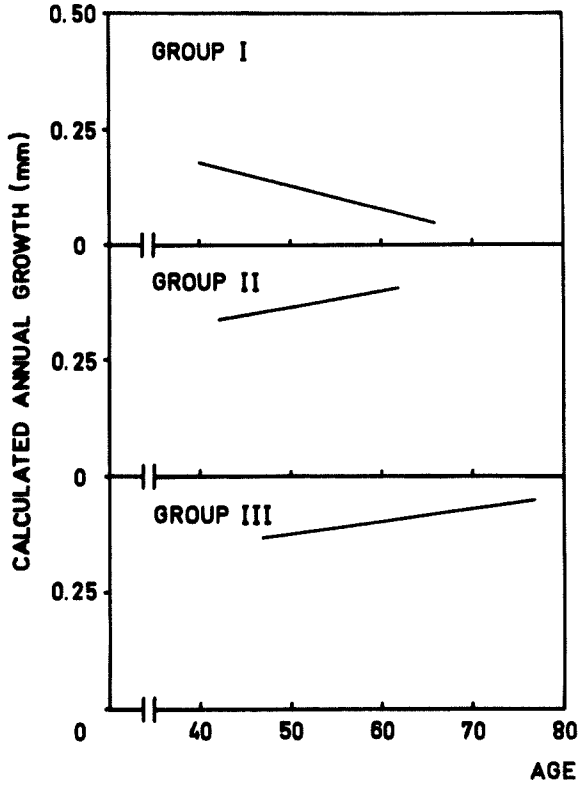

Figure 3. The relationships between age at the time of the initial radiogram and the annual growth of the combined osteophytes (mm/year). The regression lines show a negative tendency for Group I and positive tendencies for Groups II and III.

In Group III the osteophytes in the knee joints with structural changes already in the initial radiogram were significantly larger than in the other groups (Table 1). In Groups I and II the size of the osteophytes on the initial radiograms was significantly correlated with age, but this was not the case in Group III (Figure 2).

The annual growth of the osteophytes, a theoretical variable obtained by dividing the change in size between the first and the second radiograms by the number of years elapsed between the two investigations, was compared between the groups in relation to age. The calculated growth-rate was significantly greater in Groups II and III than in Group I. Although, as previously demonstrated, the size of the osteophytes increased with age, the growth-rate tended to decrease somewhat with age in Group I. In Groups II and III, cases with

structural changes as a sign of osteoarthritis, there was no such tendency (Figure 3).

Of the 57 cases with previous injury to the anterior cruciate ligament osteophytes were observed in 9.

DISCUSSION

As previously demonstrated by Danielsson & Hernborg (1970), the presence of osteophytes does not necessarily indicate that structural changes in the knee joint will follow later on in life. The present study also demonstrates that the size of the osteophytes in patients without structural changes offers no guidance to whether such changes will develop. The size of the osteophytes increased in the group as such at least up to the age of 70. The growth was more rapid if structural changes, that is osteoarthritis, developed and the osteophytes continued to grow in osteoarthritic joints.

The finding of 9 joints with osteophytes in 59 young individuals who had sustained ligamental injury appears to be more than should be expected in this age group. In an experimental study Marshall (1969) was able to produce osteophytes in the knee joints of dogs by dividing the ligaments. Therefore, age and age-related osteoarthritis should not be regarded as the only causes of osteophytes in the knee joints.

SUMMARY

Osteophytes in the knee joints are probably most of all related to age and are not necessarily an early sign of osteoarthritis. However, osteophytes are frequently observed in cases who later on develop osteoarthritis and continue to grow in size in these cases at a faster rate than in cases who do not develop osteoarthritis with structural changes in the joint.

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